DELAWARE CENTER FOR THE INLAND BAYS

Inland Bays Journal

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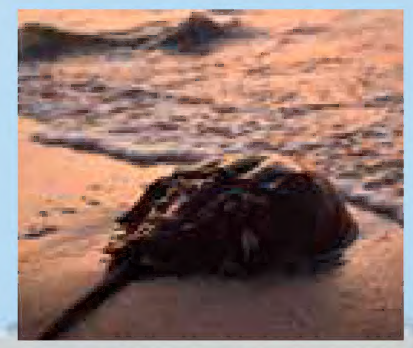

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BYGONE BAYGRASS:
Vital Aquatic Vegetation Needs Our Help

Baygrasses—also known as submerged aquatic vegetation or SAV—are a vital part of a healthy estuary. These underwater grasses absorb excess nutrients, helping to keep the water clean. They also aid in reducing erosion and improve water clarity by anchoring the sediment on the bay floor. Many aquatic species, like blue crabs and fish, use baygrass beds as an important habitat to hide from predators and feed on abundant food found there. Small invertebrates and shorebirds also use the grasses as a food source.

Until recently, we were unsure of exactly how well these plant communities, which are notably sensitive to pollution and climate change, were faring in the Inland Bays. The first formal mapping effort in the Bays was completed by the Center in spring 2020 through fall 2021 and showed that these integral baygrasses need help.

Using an innovative combination of drone technologies, geospatial mapping, and on-the-ground surveys, scientists and volunteers investigated 1,628 acres of water within the tidal waters of Inland Bays. Only 10.7 acres (0.66%) contained baygrass beds,

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The Inland Bays Journal is a publication of the Delaware Center for the Inland Bays. The Center is a nonprofit organization and a National Estuary Program. The purpose of the Inland Bays Journal is to educate and inspire people about this estuary of national significance and its restoration.

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Cover photo: Andrew McGowan, Manager of Estuary Science, snorkels over a patch of vegetation in search of baygrass beds in the Indian River Bay.

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From the Director

My last letter to you is something I never dreamed of writing. In my 18 years of service to this spectacular organization, I never saw myself doing anything else but this job that I have loved so much.

But lately, balance between the demands of leadership and being present with my young daughters has been hard to achieve. And when I unexpectedly lost my life-long best friend last year, I had the very personal realization that we do get just one chance. So, when a special opportunity for my wife to re-engage her career after it was put on hold to raise the kids, we made the leap and switched roles.

This was the hardest decision I have ever made. But my doubts were finally cleared by a recent camping trip to the mountains. My kids and I explored a little stream that flowed past camp. We talked about how the water carried materials as it flowed downhill. We became beavers creating a small dam and observing how it changed the stream. We saw our reflections in the newly-forming pool, we got muddy, we laughed a lot; I was only there with them.

Leadership transitions can be challenging. But for the Center, the timing of this one is good. The past few years have been marked by growth and important accomplishments. Last year, we revised the Comprehensive Conservation and Management Plan for the Bays, successfully advocated for the creation of Delaware's Clean Water Trust, and ramped up reforestation and land protection efforts. This year we will release the latest State of the Bays report and break ground on the final phase of the James Farm Ecological Preserve Master Plan. We have embarked on a new strategic plan to engage more diverse constituents and save more natural lands from development. Supporting these efforts is our strongest financial position ever thanks to increased funding from all levels of government and a loyal group of private donors. The Center's Board demonstrates an increasing excellence that is underpinned by a growing and highly-talented staff of scientists and educators. Finally, the Center is now under the very capable leadership of Anna Fagan (née Short) who will serve as the Acting Director while the search for the next Executive Director ensues.

I have no doubts that the Center's next leader will grow its partnerships and effectiveness to finish the job of restoring healthy Bays. I believe in the capacity of this community to realize that. And I know that decades from now, when we gaze down into the Bays, we will see reflected back at us the commitment, sacrifice, and creativity that it took to be successful.

I've always felt incredibly lucky to contribute to the protection and restoration of these beautiful waters that mean so much to so many. Along the way, we've helped lead the growing movement to protect Delaware's environment. And we've advanced the interconnections of community and science to further ecosystem restoration. But for me, the best part about this journey was you, your enthusiasm and your support. The Center has always been built upon your dedication.

So thank you, one last time, for everything you have done for the Inland Bays.

Chris Bason
Executive Director

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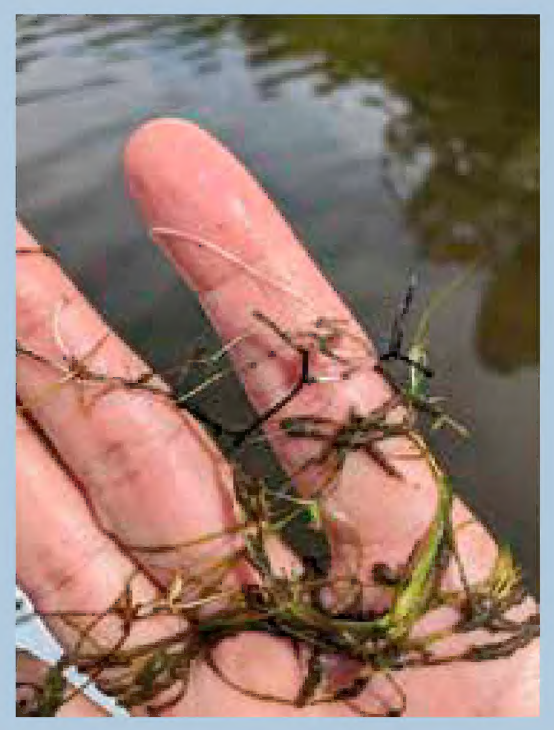
9.5 acres of which were dominated by a bed of horned pondweed in Love Creek. Horned pondweed thrives in less salty waters typically found in upper tributary areas. The remaining 1.2 acres were comprised of widgeon grass, a thread-like baygrass that thrives in saltier waters. Virtually no eelgrass, a key species that is intolerant of nutrient pollution and water temperatures above 86 degrees, was found.

Baygrasses are much more abundant in neighboring coastal bays. The Maryland Coastal Bays supports thousands of acres of baygrass. This difference underscores the dire condition of these habitats within the Inland Bays.

Similar to grasses on land, underwater baygrasses use photosynthesis to create energy needed to grow. However, algae blooms fueled by nutrient pollution like nitrogen and phosphorous prevent the necessary sunlight from reaching the bay floor and cause baygrasses to die. Without baygrasses to hold the bay floor in place, the water may become clouded with sediment, reducing light availability even further and preventing their reestablishment.

"It is clear after mapping that a major restoration effort will be needed. Nutrient pollution and a lack of available seed to self-replenish lost beds have greatly reduced the extent of baygrass habitats in our system," said Andrew McGowan, Manager of Estuary Science at the Center. "However, thanks to this effort, we have found some remnant beds still holding on, and we will now focus our efforts towards protecting and growing those areas."



Horned pondweed in Love Creek, Rehoboth Beach.

Long-term restoration efforts will focus on expanding the beds found during the mapping process, as well as monitoring for suitability in new areas without existing beds. Key factors for baygrass to grow include areas that are not routinely impacted by human activity and have ample light availability at the bay floor. To expand beds or create new ones in the Bays, the Center harvests seeds from a local donor bed where environmental conditions support healthy baygrasses. This seed is processed during the winter months to ensure the best chance of survival. The following spring after the seeds are harvested, they are hand-spread across the suitable sites for the seeds to germinate and take root.

"These methods take time, as will the restoration, which will happen over decades, not years," said McGowan.

While all mapping methods allowed for the easy identification of underwater vegetation compared to bare sediment, poor visibility in the water led to the cancellation of several survey events.

Volunteers worked in pairs to plant 2,425 seedlings off of Lighthouse Rd. in Selbyville.

The Best Time to Plant a Tree is NOW:
Reforestation in the Inland Bays

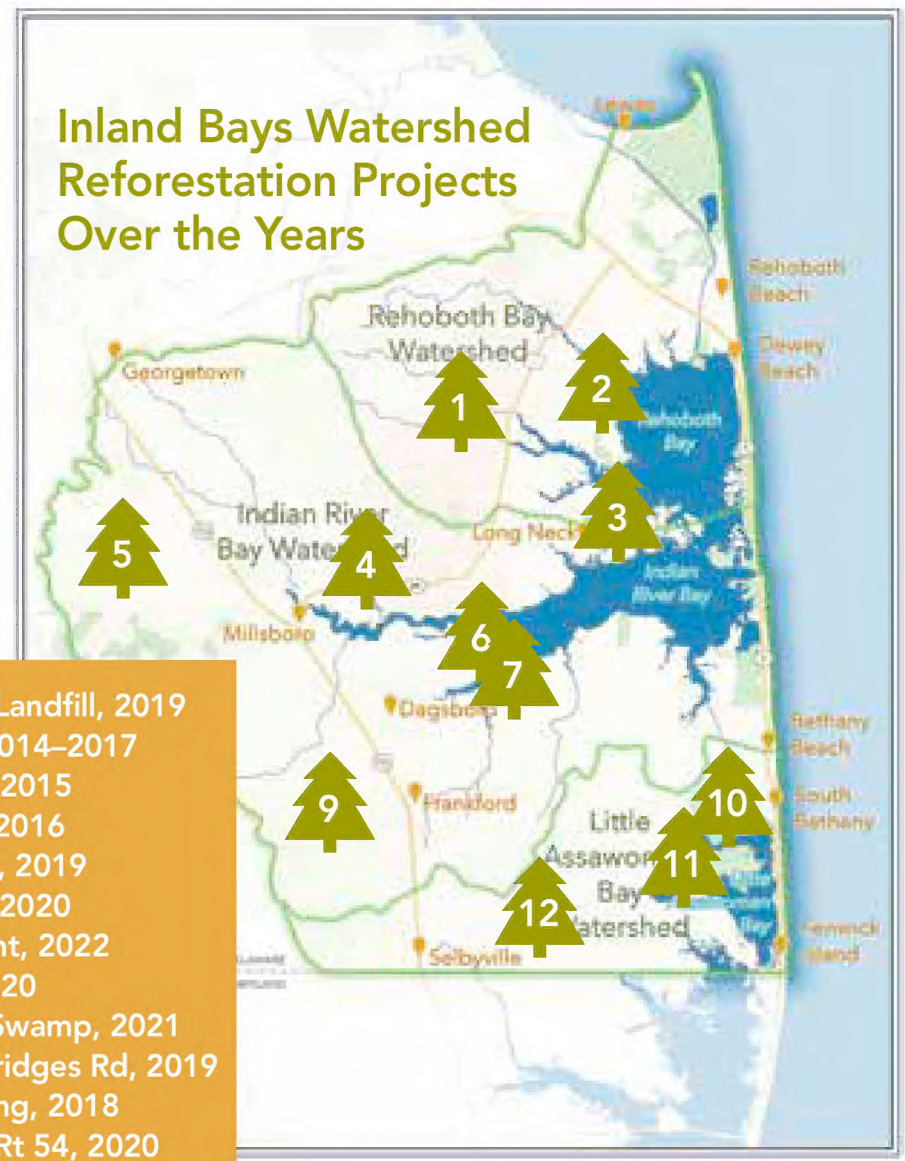
The Inland Bays watershed is experiencing rapid land-use changes. Between 1992 and 2012 alone, the amount of upland forests decreased by 14 square miles, while developed lands increased by 34 square miles. This loss of forested land has significant negative consequences, including a reduction in water quality and a critical loss of wildlife habitat. Two of the Center's recent reforestation projects aim to restore former agricultural lands back to contiguous hardwood forests and combat the pervasive threats of habitat loss, nutrient pollution, and climate change.

A 6.5-acre parcel of land that drains to Little Assawoman Bay now supports **7,425 tree seedlings**, thanks to a partnership between the Center and Sussex County. In March 2022, over 30 Center volunteers planted **2,425** of those seedlings off of Lighthouse Road in Selbyville. Working in pairs, the volunteers gave the black locust, hackberry, persimmon, and several varieties of native oak and pine seedlings a new home.

A second reforestation project also took root in March. Completed in partnership with DNREC Division of Fish and Wildlife, a 20-acre parcel located at Piney Point in Bethany Beach was reforested with **18,500 trees.** These include native species such as black locust, chickasaw plum, hackberry, persimmon, and several varieties of oaks.

Center staff and volunteers will monitor both reforestation sites as they continue to grow. Once mature, the combined total of nearly **26,000 trees** will provide flood mitigation benefits and reduce the amount of nutrient pollution reaching the Inland Bays. The Center estimates an annual reduction of nitrogen and phosphorus input to the Bays of 450.5 pounds and 10.6 pounds, respectively.

In addition to providing 19 acres of interior forest habitat over the next 20 years, the newly planted trees will also capture and store approximately 52,474,679 pounds of atmospheric carbon dioxide. Investing in reforestation efforts like this further supports Delaware's 2021 Climate Action Plan goal of increasing the number of forest buffers next to croplands to 1,000 acres in the Inland Bays and Chesapeake watersheds by 2025.



1 Sussex County Landfill, 2019
2 Angola Neck, 2014–2017
3 Poplar Thicket, 2015
4 Bullseye Ferry, 2016
5 Midlands WMA, 2019
6 Ware Cove Rd, 2020
7 AWA Piney Point, 2022
8 Burbage Rd, 2020
9 Great Cypress Swamp, 2021
10 AWA Double Bridges Rd, 2019
11 Sassafras Landing, 2018
12 Sussex County Rt 54, 2020

DONOR SPOTLIGHT:
Susie Ball Leaves Her Footprints on the Future

Susie Ball has always had a passion for nature. As a biology major in college before becoming a doctor, Susie dabbled in birdwatching in her limited free time. Once she retired to Rehoboth Beach in 2012, she sought ways to combine her passion with making a meaningful impact in her community. Susie attended a lecture about the Inland Bays and was immediately hooked.

"The Inland Bays are such a draw for people who love nature. It is so important to preserve them and the beautiful creeks that flow into them," she said.

Susie Ball is a dedicated Center volunteer, donor, and Board Chair.

Susie Ball (center) participates in horseshoe crab surveys, one of her favorite ways to get involved with the Center's mission.

Susie initially joined the Center's Citizens Advisory Committee (CAC) in 2014 and was later nominated to serve as Chair in 2016. Following her tenure as CAC Chair, she was elected as Chair of the Board of Directors in 2018. In addition to her work as the Team Leader of the Tower Road Horseshoe Crab Survey, Susie serves on the Development Committee. She is proud of the work done by her fellow members to build a strong team helping to raise funds for the Center's work.

"When we discussed a Legacy Circle, I was thrilled by the opportunity to contribute to the health of Bays beyond my lifetime. It will help to carry on a mission that is so important to me," said Susie.

The Inland Bays Legacy Circle is a small but mighty group of supporters that want their voice in the fight for healthy Bays to speak loud and clear for generations to come. It enables people who are passionate about the Bays, like Susie, to channel that passion long after their lifetime through planned giving.

"Planned giving ensures that we leave our footprints on the future," she says.

Donors don't have to be super-wealthy to become a member of the Inland Bays Legacy Circle. Planned gifts are easy to set up and come in all shapes and sizes, all of which are equally valuable to the Center's mission. The simplest ways you can set up a planned gift is by including a charitable bequest in your will or by making the Center a beneficiary of a retirement account.

There are many benefits to planned giving and Center staff are happy to guide you through the process. If you are considering a planned gift, you can find additional information at inlandbays.org/plannedgiving.

MAKING AN AWARD-WINNING VISION A REALITY

Progress Continues on Implementing the James Farm Ecological Preserve Master Plan

The James Farm Ecological Preserve has long provided the community with a meaningful connection to nature. This is especially true for students who are immersed in the diverse ecosystems found onsite through the Center's Student Estuary Exploration (SEE) program. The goal of this outdoor, experiential-learning opportunity for youth across the Inland Bays watershed and beyond is to heighten imagination, increase critical thinking, and empower students to take responsible action to protect the environment.

Very soon, the educational facilities at the Preserve will receive much-needed renovations to accommodate more students while also supporting new opportunities for intergenerational programming. To say that the Center's education team is excited about the future three-season education building would be an understatement!

But capacity and functionality aren't the only exciting parts of the project. Special care was taken to ensure that the architecture is as unique and appealing as the natural wonder of the Preserve. Structural designs hold true to the agricultural heritage of the property and the region, making it a truly special place in Delaware.

And these efforts paid off. The Center is proud to announce that the James Farm Ecological Preserve Master Plan was the recipient of a 2021 Professional Design Award from the Maryland Chapter of the American Society of Landscape Architects.

The Center is humbled by this recognition and is looking forward to breaking ground later this year. In addition to the new education building, other improvements include realignment of the existing trail system, new maintenance facilities, and an integrated system of interpretive and wayfinding signage. These will help to improve visitor experience while ensuring the Center can better care for the Preserve's valuable ecosystems.

Efforts to complete the project are supported by the Lessons in Nature Capital Campaign, which continues to seek donations and in-kind support from the community. To learn more or support these efforts, visit inlandbays.org/james-farm-master-plan.

2021 Survey Highlights

The highest single-night count of **1,464** crabs occurred at the James Farm Ecological Preserve on June 10. This is an average of more than 14 crabs for every meter of shoreline! Volunteers count horseshoe crabs using 1-meter quadrats (measuring squares). At each site, a total of 100 quadrants are counted.

A combined total of **25,934** crabs (22,547 males and 3,387 females) were counted at 6 beaches across 14 survey nights in the Rehoboth and Indian River Bays. The average number of male crabs for each female was 6.7, which indicates a healthy level of genetic variability.

Volunteers tagged **2,567** crabs. Spot a horseshoe crab with a tag? Report it to the U.S. Fish & Wildlife Service at fws.gov/crabtag.

ANCIENT ARTHROPODS:
Surveying Horseshoe Crabs Along the Inland Bays

Each year, a prehistoric pilgrimage takes place under the full and new moons of late spring: thousands of horseshoe crabs make their way to the sandy shores of the Inland Bays to spawn. Researchers and curious onlookers alike gather at the waterline to observe this awe-inspiring phenomenon.

Horseshoe crabs are ecologically, economically, and culturally important to the Inland Bays. However, their impact extends far beyond the borders of the Bays. Their billions of tiny pale-green colored eggs are a critical food source for many species of migrating shorebirds and fish. Furthermore, horseshoe crab blood contains limulus amebocyte lysate (LAL) — a widely used and important extract that is used to test for bacterial contamination of medical devices and injectable drugs.

Since 2008, the Center's annual Horseshoe Crab Survey has provided important data used to assist in better management of horseshoe crab populations. As a citizen science project, Center scientists and volunteers work together to study horseshoe crab spawning population, density, and genetic diversity.

The Center also collaborates with the U.S. Fish & Wildlife Service on a tagging program to help track the migration and movement of horseshoe crabs along the coastline and through inland waters.

While these survey results indicate that the local population of horseshoe crabs has remained stable for the past five years, the numbers remain far below historic levels. Primary threats include overharvesting for bait and medical use, as well as habitat loss.

Horseshoe crabs play a critical role in supporting healthy ecosystems, and together, we can play an equally critical role in their conservation and management. For more information and to get involved in the Center's survey, visit inlandbays.org/horseshoe-crab-survey.

DELAWARE CENTER FOR THE
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